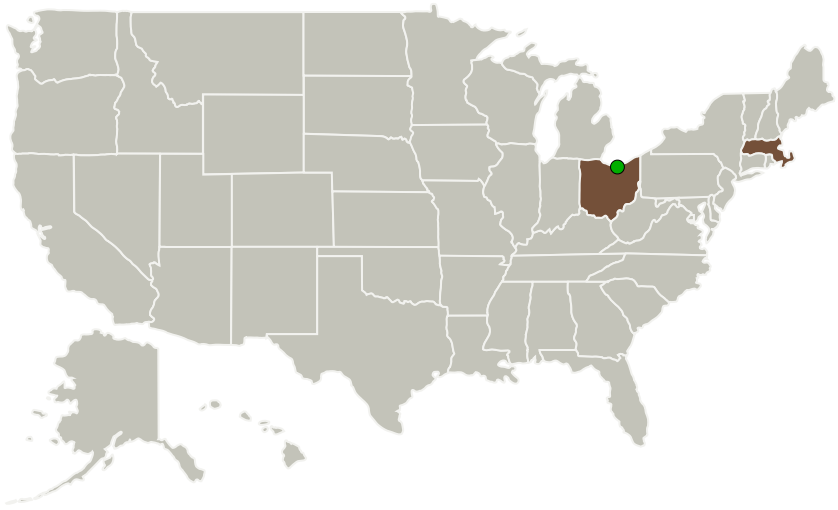
Water Management Membrane for Fuel Cells and Electrolyzers, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

Development of an improved water management membrane for a static vapor feed electrolyzer that produces sub-saturated H2 and O2 is proposed. This improved membrane can increase the performance and especially the durability of static vapor feed electrolyzers. Static vapor feed electrolyzers greatly simplify electrolyzer systems as they eliminate the need for water/gas phase separation, which is particularly challenging in a zero gravity environment. Maintaining water in the vapor phase greatly reduces membrane swelling which should increase durability. Finally, by keeping water in the vapor phase the MEA is not exposed to ion and other contaminants that are carried by a liquid water stream, further increasing durability and simplifying the system by reducing the need for ultra-pure water. The primary goal of this Phase I program then is to demonstrate the enhanced performance and durability of a static vapor feed electrolyzer utilizing an improved water management membrane.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Giner, Inc.	Lead Organization	Industry	Newton, Massachusetts
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

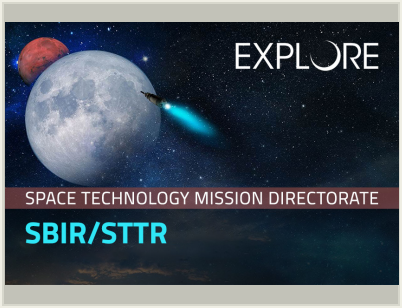


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Table of Contents

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Primary U.S. Work Locations	
Massachusetts	Ohio

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Summary: Water Management Membrane for Fuel Cells and Electroly zers, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/140116)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Giner, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Cortney K Mittelsteadt

Co-Investigator:

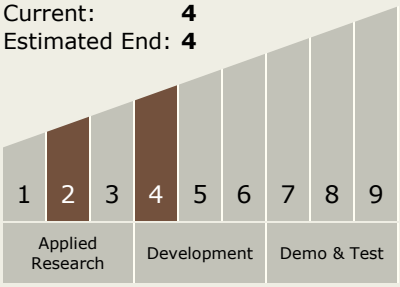
Cortney Mittelsteadt

Water Management Membrane for Fuel Cells and Electrolyzers, Phase I

Completed Technology Project (2010 - 2010)

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.2 Energy Storage
    - TX03.2.2 Electrochemical: Fuel Cells

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System